



A-378CIP5 rev.ST25.txt
SEQUENCE LISTING

RECEIVED
OCT 08 2002
TECH CENTER 1600/2900

<110> BOYLE, WILLIAM J.
LACEY, DAVID LEE
CALZONE, FRANK J.
CHANG, MING-SHI
SENALDI, GIORGIO

<120> COMBINATION THERAPY FOR CONDITIONS LEADING TO BONE LOSS

<130> A-378CIP5

<140> US 09/613,591

<141> 2000-07-10

<150> US 09/457,647

<151> 1999-12-09

<150> US 09/350,670

<151> 1999-07-09

<150> US 08/706,945

<151> 1996-09-03

<150> US 08/577,788

<151> 1995-12-22

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<211> 43

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<213> Mus musculus

<400> 80
tacgcactgg atccttatgt tgcatttcct ttctgaatta gca 43

<210> 81

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<223> pAMG21

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tatgttaatg ag

12

<210> 86

<211> 14

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<211> 26

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<211> 50

<212> DNA

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<210> 95

<211> 50

<212> DNA

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<210> 96

<211> 49

<212> DNA

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<223> pAMG21-huOPG

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<210> 97

<211> 26

<212> DNA

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<223> pAMG21-huOPG

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<210> 98

<211> 50

<212> DNA

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<220>

<223> pAMG21-huOPG

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50

<210> 99

<211> 49

<212> DNA

<213> Artificial Sequence

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<223> pAMG21-huOPG

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49

<210> 100

<211> 50

<212> DNA

<213> Artificial Sequence

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<223> pAMG21-huOPG

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<211> 59

<212> DNA

<213> Homo sapiens

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59

<210> 102

<211> 48

<212> DNA

<213> Homo sapiens

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<210> 103

<211> 31

<212> DNA

<213> Homo sapiens

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<210> 104

<211> 59

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<211> 54

<212> DNA

<213> Homo sapiens

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<210> 106

<211> 31

<212> DNA

<213> Homo sapiens

<400> 106
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<210> 107

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> PCR primer for Fc-hOPG fusion protein.

<400> 107

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<210> 108

<211> 44

<212> DNA

<213> Artificial Sequence

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<223> PCR primer for FchOPG fusion protein.

<400> 108

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<210> 109

<211> 45

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<213> Artificial Sequence

<220>

<223> Fc/muOPG

<400> 109

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<211> 39

<212> DNA

<213> Artificial Sequence

<220>

<223> Fc/muOPG

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<210> 111

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> muOPG

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36

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<223> muOPG

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34

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<400> 113

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36

<210> 114

<211> 35

<212> DNA

<213> Artificial Sequence

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<212> DNA

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<223> pAMG21-huOPG

<220>

<221> misc_feature

<223> Linker with XbaI and KpnI sites inserted into human sequence.

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aactagtcac cagctgctgt gtgataaatg tccgccgggt ac 102

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<223> huOPG

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<211> 62

<212> DNA

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<220>

<223> huOPG

<400> 117

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<220>

<223> huOPG

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tt 62

<210> 119

<211> 51

<212> PRT

<213> Homo sapiens

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Tyr His Tyr Tyr Asp Gln Asn Gly Arg Met Cys Glu Glu Cys His Met
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Cys Gln Pro Gly His Phe Leu Val Lys His Cys Lys Gln Pro Lys Arg
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Asp Thr Val Cys His Lys Pro Cys Glu Pro Gly Val Thr Tyr Thr Asp
35 40 45

Asp Trp His
50

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<211> 2432

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<213> Rattus rattus

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<222> (124)..(1326)

<223>

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aca atg aac aag tgg ctg tgc tgt gca ctc ctg gtg ttc ttg gac atc      168
  Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile
    1          5          10          15

att gaa tgg aca acc cag gaa acc ttt cct cca aaa tac ttg cat tat      216
  Ile Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr
                20          25          30

gac cca gaa acc gga cgt cag ctc ttg tgt gac aaa tgt gct cct ggc      264
  Asp Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly
                35          40          45

acc tac cta aaa cag cac tgc aca gtc agg agg aag aca ctg tgt gtc      312
  Thr Tyr Leu Lys Gln His Cys Val Arg Arg Lys Thr Leu Cys Val
    50          55          60

cct tgc cct gac tac tct tat aca gac agc tgg cac acg agt gat gaa      360
  Pro Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu
    65          70          75

tgc gtg tac tgc agc ccc gtg tgc aag gaa ctg cag acc gtg aaa cag      408
  Cys Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln
    80          85          90          95

gag tgc aac cgc acc cac aac cga gtg tgc gaa tgt gag gaa ggg cgc      456
  Glu Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg
                100          105          110

tac ctg gag ctc gaa ttc tgc ttg aag cac cgg agc tgt ccc cca ggc      504
  Tyr Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly
                115          120          125

ttg ggt gtg ctg cag gct ggg acc cca gag cga aac acg gtt tgc aaa      552
  Leu Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys
    130          135          140

aga tgt ccg gat ggg ttc ttc tca ggt gag acg tca tcg aaa gca ccc      600
  Arg Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro
    145          150          155

tgt agg aaa cac acc aac tgc agc tca ctt ggc ctc ctg cta att cag      648
  Cys Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln
    160          165          170          175

aaa gga aat gca aca cat gac aat gta tgt tcc gga aac aga gaa gca      696
  Lys Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala
    180          185          190

act caa aat tgt gaa ata gat gtc acc ctg tgc gaa gag gca ttc ttc      744
  Thr Gln Asn Cys Glu Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe
    195          200          205

agg ttt gct gtg cct acc aag att ata ccg aat tgg ctg agt gtt ctg      792
  Arg Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu
    210          215          220

gtg gac agt ttg cct ggg acc aaa gtg aat gca gag agt gta gag agg      840
  Val Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg
    225          230          235

ata aaa cgg aga cac agc tgc caa gag caa act ttc cag cta ctt aag      888
  Ile Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys
    240          245          250          255

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gcg aac ctc acc aca gag cag ctc cgc atc ttg atg gag agc ttg cct Ala Asn Leu Thr Thr Glu Gln Leu Arg Ile Leu Met Glu Ser Leu Pro 290 295 300	1032
ggg aag aag atc agc cca gac gag att gag aga acg aga aag acc tgc Gly Lys Lys Ile Ser Pro Asp Glu Ile Glu Arg Thr Arg Lys Thr Cys 305 310 315	1080
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aat gga gac caa gac acc ttg aag ggc ctg atg tac gca ctc aag cac Asn Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His 340 345 350	1176
ttg aaa gca tac cac ttt ccc aaa acc gtc acc cac agt ctg agg aag Leu Lys Ala Tyr His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys 355 360 365	1224
acc atc agg ttc ttg cac agc ttc acc atg tac cga ttg tat cag aaa Thr Ile Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys 370 375 380	1272
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 aagactatta cagtattgct atttatatcc atccag 2432

<210> 121

<211> 401

<212> PRT

<213> Rattus rattus

<400> 121

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Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
 35 40 45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
 50 55 60

Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
 65 70 75 80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln Glu
 85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
 100 105 110

Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
 115 120 125

Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
 130 135 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
 145 150 155 160

Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln Lys
 165 170 175

Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr
 180 185 190

Gln Asn Cys Glu Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
195 200 205

Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val
210 215 220

Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
225 230 235 240

Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
245 250 255

Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln
260 265 270

Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Ile Gly His Ala
275 280 285

Asn Leu Thr Thr Glu Gln Leu Arg Ile Leu Met Glu Ser Leu Pro Gly
290 295 300

Lys Lys Ile Ser Pro Asp Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys
305 310 315 320

Pro Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
325 330 335

Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu
340 345 350

Lys Ala Tyr His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr
355 360 365

Ile Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu
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Leu

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<211> 1325

<212> DNA

<213> Mus musculus

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<221> CDS

<222> (91)..(1293)

<223>

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<221> misc_feature

<222> (11)..(11)

<223> At position 11, R is a purine.

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1 5ctc ctg gtg ctc ctg gac atc att gaa tgg aca acc cag gaa acc ctt 162
Leu Leu Val Leu Leu Asp Ile Ile Glu Trp Thr Thr Gln Glu Thr Leu
10 15 20ctt cca aag tac ttg cat tat gac cca gaa act ggt cat cag ctc ctg 210
Leu Pro Lys Tyr Leu His Tyr Asp Pro Glu Thr Gly His Gln Leu Leu
25 30 35 40tgt gac aaa tgt gct cct ggc acc tac cta aaa cag cac tgc aca gtg 258
Cys Asp Lys Cys Ala Pro Gly Thr Tyr Leu Lys Gln His Cys Thr Val
45 50 55agg agg aag aca ttg tgt gtc cct tgc cct gac cac tct tat acg gac 306
Arg Arg Lys Thr Leu Cys Val Pro Cys Pro Asp His Ser Tyr Thr Asp
60 65 70agc tgg cac acc agt gat gag tgt gtg tat tgc agc cca gtg tgc aag 354
Ser Trp His Thr Ser Asp Glu Cys Val Tyr Cys Ser Pro Val Cys Lys
75 80 85gaa ctg cag tcc gtg aag cag gag tgc aac cgc acc cac aac cga gtg 402
Glu Leu Gln Ser Val Lys Gln Glu Cys Asn Arg Thr His Asn Arg Val
90 95 100tgt gag tgt gag gaa ggg cgt tac ctg gag atc gaa ttc tgc ttg aag 450
Cys Glu Cys Glu Glu Gly Arg Tyr Leu Glu Ile Glu Phe Cys Leu Lys
105 110 115 120cac cgg agc tgt ccc ccg ggc tcc ggc gtg gtg caa gct gga acc cca 498
His Arg Ser Cys Pro Pro Gly Ser Gly Val Val Gln Ala Gly Thr Pro
125 130 135gag cga aac aca gtt tgc aaa aaa tgt cca gat ggg ttc ttc tca ggt 546
Glu Arg Asn Thr Val Cys Lys Lys Cys Pro Asp Gly Phe Phe Ser Gly
140 145 150gag act tca tcg aaa gca ccc tgt ata aaa cac acg aac tgc agc aca 594
Glu Thr Ser Ser Lys Ala Pro Cys Ile Lys His Thr Asn Cys Ser Thr
155 160 165

ttt ggc ctc ctg cta att cag aaa gga aat gca aca cat gac aac tgt 642

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Cys	Ser	Gly	Asn	Arg	Glu	Ala	Thr	Gln	Lys	Cys	Gly	Ile	Asp	Val	Thr	
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Asn	Ala	Glu	Ser	Val	Glu	Arg	Ile	Lys	Arg	Arg	His	Ser	Ser	Gln	Glu	
		235					240					245				
caa	acc	ttc	cag	ctg	ctg	aag	ctg	tgg	aaa	cat	caa	aac	aga	gac	cag	882
Gln	Thr	Phe	Gln	Leu	Leu	Lys	Leu	Trp	Lys	His	Gln	Asn	Arg	Asp	Gln	
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Glu	Arg	Thr	Arg	Lys	Thr	Cys	Lys	Ser	Ser	Glu	Gln	Leu	Leu	Lys	Leu	
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ctc	agt	tta	tgg	agg	atc	aaa	aat	ggt	gac	caa	gac	acc	ttg	aag	ggc	1122
Leu	Ser	Leu	Trp	Arg	Ile	Lys	Asn	Gly	Asp	Gln	Asp	Thr	Leu	Lys	Gly	
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Leu	Met	Tyr	Ala	Leu	Lys	His	Leu	Lys	Thr	Ser	His	Phe	Pro	Lys	Thr	
345				350					355						360	
gtc	acc	cac	agt	ctg	agg	aag	acc	atg	agg	ttc	ctg	cac	agc	ttc	aca	1218
Val	Thr	His	Ser	Leu	Arg	Lys	Thr	Met	Arg	Phe	Leu	His	Ser	Phe	Thr	
				365				370						375		
atg	tac	aga	ctg	tat	cag	aag	ctc	ttt	tta	gaa	atg	ata	ggg	aat	cag	1266
Met	Tyr	Arg	Leu	Tyr	Gln	Lys	Leu	Phe	Leu	Glu	Met	Ile	Gly	Asn	Gln	
			380					385					390			
gtt	caa	tcc	gtg	aaa	ata	agc	tgc	tta	taactaggaa	tggtcactgg						1313
Val	Gln	Ser	Val	Lys	Ile	Ser	Cys	Leu								
		395					400									
gctgtttctt	ca															1325
<210>	123															
<211>	401															
<212>	PRT															

<213> Mus musculus

<220>

<221> misc_feature

<222> (11)..(11)

<223> At position 11, R is a purine.

<400> 123

Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Leu Leu Asp Ile Ile
 1 5 10 15

Glu Trp Thr Thr Gln Glu Thr Leu Leu Pro Lys Tyr Leu His Tyr Asp
 20 25 30

Pro Glu Thr Gly His Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
 35 40 45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
 50 55 60

Cys Pro Asp His Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
 65 70 75 80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Ser Val Lys Gln Glu
 85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
 100 105 110

Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Ser
 115 120 125

Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Lys
 130 135 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
 145 150 155 160

Ile Lys His Thr Asn Cys Ser Thr Phe Gly Leu Leu Leu Ile Gln Lys
 165 170 175

Gly Asn Ala Thr His Asp Asn Cys Cys Ser Gly Asn Arg Glu Ala Thr
 180 185 190

Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
 195 200 205

Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val
 210 215 220

Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
 225 230 235 240
 Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
 245 250 255
 Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln
 260 265 270
 Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Leu Gly His Ser
 275 280 285
 Asn Leu Thr Thr Glu Gln Leu Leu Ala Leu Met Glu Ser Leu Pro Gly
 290 295 300
 Lys Lys Ile Ser Pro Glu Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys
 305 310 315 320
 Ser Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
 325 330 335
 Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu
 340 345 350
 Lys Thr Ser His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr
 355 360 365
 Met Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu
 370 375 380
 Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
 385 390 395 400

Leu

<210> 124
 <211> 1356
 <212> DNA
 <213> Homo sapiens

<220>
 <221> CDS
 <222> (95)..(1297)
 <223>

<220>

<221> misc_feature

<222> (63)..(63)

<223> At position 63, Y is a pyrimidine.

<400> 124

gtatatataa cgtgatgagc gtacgggtgc ggagacgcac cggcgcgctc gcccagccgc 60

cgycctccaag cccctgaggt ttccggggac caca atg aac aag ttg ctg tgc tgc 115
 Met Asn Lys Leu Leu Cys Cys
 1 5

gcg ctc gtg ttt ctg gac atc tcc att aag tgg acc acc cag gaa acg 163
 Ala Leu Val Phe Leu Asp Ile Ser Ile Lys Trp Thr Thr Gln Glu Thr
 10 15 20

ttt cct cca aag tac ctt cat tat gac gaa gaa acc tct cat cag ctg 211
 Phe Pro Pro Lys Tyr Leu His Tyr Asp Glu Glu Thr Ser His Gln Leu
 25 30 35

ttg tgt gac aaa tgt cct cct ggt acc tac cta aaa caa cac tgt aca 259
 Leu Cys Asp Lys Cys Pro Pro Gly Thr Tyr Leu Lys Gln His Cys Thr
 40 45 50 55

gca aag tgg aag tcc gtg tgc gcc cct tgc cct gac cac tac tac aca 307
 Ala Lys Trp Lys Ser Val Cys Ala Pro Cys Pro Asp His Tyr Tyr Thr
 60 65 70

gac agc tgg cac acc agt gac gag tgt cta tac tgc agc ccc gtg tgc 355
 Asp Ser Trp His Thr Ser Asp Glu Cys Leu Tyr Cys Ser Pro Val Cys
 75 80 85

aag gag ctg cag tac gtc aag cag gag tgc aat cgc acc cac aac cgc 403
 Lys Glu Leu Gln Tyr Val Lys Gln Glu Cys Asn Arg Thr His Asn Arg
 90 95 100

gtg tgc gaa tgc aag gaa ggg cgc tac ctt gag ata gag ttc tgc ttg 451
 Val Cys Glu Cys Lys Glu Gly Arg Tyr Leu Glu Ile Glu Phe Cys Leu
 105 110 115

aaa cat agg agc tgc cct cct gga ttt gga gtg gtg caa gct gga acc 499
 Lys His Arg Ser Cys Pro Pro Gly Phe Gly Val Val Gln Ala Gly Thr
 120 125 130 135

cca gag cga aat aca gtt tgc aaa aga tgt cca gat ggg ttc ttc tca 547
 Pro Glu Arg Asn Thr Val Cys Lys Arg Cys Pro Asp Gly Phe Phe Ser
 140 145 150

aat gag acg tca tct aaa gca ccc tgt aga aaa cac aca aat tgc agt 595
 Asn Glu Thr Ser Ser Lys Ala Pro Cys Arg Lys His Thr Asn Cys Ser
 155 160 165

gtc ttt ggt ctc ctg cta act cag aaa gga aat gca aca cac gac aac 643
 Val Phe Gly Leu Leu Leu Thr Gln Lys Gly Asn Ala Thr His Asp Asn
 170 175 180

ata tgt tcc gga aac agt gaa tca act caa aaa tgt gga ata gat gtt 691
 Ile Cys Ser Gly Asn Ser Glu Ser Thr Gln Lys Cys Gly Ile Asp Val
 185 190 195

acc ctg tgt gag gag gca ttc ttc agg ttt gct gtt cct aca aag ttt 739

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Thr 200	Leu	Cys	Glu	Glu	Ala 205	Phe	Phe	Arg	Phe	Ala 210	Val	Pro	Thr	Lys	Phe 215	
acg Thr	cct Pro	aac Asn	tgg Trp	ctt Leu 220	agt Ser	gtc Val	ttg Leu	gta Val	gac Asp 225	aat Asn	ttg Leu	cct Pro	ggc Gly	acc Thr 230	aaa Lys	787
gta Val	aac Asn	gca Ala	gag Glu 235	agt Ser	gta Val	gag Glu	agg Arg	ata Ile 240	aaa Lys	cgg Arg	caa Gln	cac His	agc Ser 245	tca Ser	caa Gln	835
gaa Glu	cag Gln	act Thr 250	ttc Phe	cag Gln	ctg Leu	ctg Leu	aag Lys 255	tta Leu	tgg Trp	aaa Lys	cat His	caa Gln 260	aac Asn	aaa Lys	gcc Ala	883
caa Gln	gat Asp 265	ata Ile	gtc Val	aag Lys	aag Lys	atc Ile 270	atc Ile	caa Gln	gat Asp	att Ile	gac Asp 275	ctc Leu	tgt Cys	gaa Glu	aac Asn	931
agc Ser 280	gtg Val	cag Gln	cgg Arg	cac His	att Ile 285	gga Gly	cat His	gct Ala	aac Asn	ctc Leu 290	acc Thr	ttc Phe	gag Glu	cag Gln	ctt Leu 295	979
cgt Arg	agc Ser	ttg Leu	atg Met	gaa Glu 300	agc Ser	tta Leu	ccg Pro	gga Gly	aag Lys 305	aaa Lys	gtg Val	gga Gly	gca Ala	gaa Glu 310	gac Asp	1027
att Ile	gaa Glu	aaa Lys	aca Thr 315	ata Ile	aag Lys	gca Ala	tgc Cys	aaa Lys 320	ccc Pro	agt Ser	gac Asp	cag Gln	atc Ile 325	ctg Leu	aag Lys	1075
ctg Leu	ctc Leu	agt Ser 330	ttg Leu	tgg Trp	cga Arg	ata Ile	aaa Lys 335	aat Asn	ggc Gly	gac Asp	caa Gln	gac Asp 340	acc Thr	ttg Leu	aag Lys	1123
ggc Gly 345	cta Leu	atg Met	cac His	gca Ala	cta Leu	aag Lys 350	cac His	tca Ser	aag Lys	acg Thr	tac Tyr 355	cac His	ttt Phe	ccc Pro	aaa Lys	1171
act Thr 360	gtc Val	act Thr	cag Gln	agt Ser	cta Leu 365	aag Lys	aag Lys	acc Thr	atc Ile	agg Thr 370	ttc Phe	ctt Leu	cac His	agc Ser	ttc Phe 375	1219
aca Thr	atg Met	tac Tyr	aaa Lys	ttg Leu 380	tat Tyr	cag Gln	aag Lys	tta Leu	ttt Phe 385	tta Leu	gaa Glu	atg Met	ata Ile	ggt Gly 390	aac Asn	1267
cag Gln	gtc Val	caa Gln	tca Ser 395	gta Val	aaa Lys	ata Ile	agc Ser	tgc Cys 400	tta Leu	taactggaaa	tgccattga					1317
gctggtttcct	cacaattggc	gagatcccat	ggatgataa													1356

<210> 125

<211> 401

<212> PRT

<213> Homo sapiens

<220>

<221> misc_feature

<222> (63)..(63)

<223> At position 63, Y is a pyrimidine.

<400> 125

Met Asn Lys Leu Leu Cys Cys Ala Leu Val Phe Leu Asp Ile Ser Ile
 1 5 10 15

Lys Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
 20 25 30

Glu Glu Thr Ser His Gln Leu Leu Cys Asp Lys Cys Pro Pro Gly Thr
 35 40 45

Tyr Leu Lys Gln His Cys Thr Ala Lys Trp Lys Ser Val Cys Ala Pro
 50 55 60

Cys Pro Asp His Tyr Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
 65 70 75 80

Leu Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Tyr Val Lys Gln Glu
 85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Lys Glu Gly Arg Tyr
 100 105 110

Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Phe
 115 120 125

Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
 130 135 140

Cys Pro Asp Gly Phe Phe Ser Asn Glu Thr Ser Ser Lys Ala Pro Cys
 145 150 155 160

Arg Lys His Thr Asn Cys Ser Val Phe Gly Leu Leu Leu Thr Gln Lys
 165 170 175

Gly Asn Ala Thr His Asp Asn Ile Cys Ser Gly Asn Ser Glu Ser Thr
 180 185 190

Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
 195 200 205

Phe Ala Val Pro Thr Lys Phe Thr Pro Asn Trp Leu Ser Val Leu Val
 210 215 220

Asp Asn Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
 225 230 235 240

Lys Arg Gln His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
 245 250 255

Trp Lys His Gln Asn Lys Ala Gln Asp Ile Val Lys Lys Ile Ile Gln
 260 265 270
 Asp Ile Asp Leu Cys Glu Asn Ser Val Gln Arg His Ile Gly His Ala
 275 280 285
 Asn Leu Thr Phe Glu Gln Leu Arg Ser Leu Met Glu Ser Leu Pro Gly
 290 295 300
 Lys Lys Val Gly Ala Glu Asp Ile Glu Lys Thr Ile Lys Ala Cys Lys
 305 310 315 320
 Pro Ser Asp Gln Ile Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
 325 330 335
 Gly Asp Gln Asp Thr Leu Lys Gly Leu Met His Ala Leu Lys His Ser
 340 345 350
 Lys Thr Tyr His Phe Pro Lys Thr Val Thr Gln Ser Leu Lys Lys Thr
 355 360 365
 Ile Arg Phe Leu His Ser Phe Thr Met Tyr Lys Leu Tyr Gln Lys Leu
 370 375 380
 Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
 385 390 395 400

Leu

<210> 126
 <211> 139
 <212> PRT
 <213> Homo sapiens

<400> 126

Cys Pro Gln Gly Lys Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys
 1 5 10 15
 Thr Lys Cys His Lys Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro
 20 25 30
 Gly Gln Asp Thr Asp Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala
 35 40 45
 Ser Glu Asn His Leu Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys
 50 55 60

Glu Met Gly Gln Val Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr
65 70 75 80

Val Cys Gly Cys Arg Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn
85 90 95

Leu Phe Gln Cys Phe Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His
100 105 110

Leu Ser Cys Gln Glu Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly
115 120 125

Phe Phe Leu Arg Glu Asn Glu Cys Val Ser Cys
130 135

<210> 127

<211> 48

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 127

acctacttct ttgaagagta gtcgacgaca cactattttac aggcgggcc

48

<210> 128

<211> 219

<212> PRT

<213> Rattus rattus

<400> 128

Met Leu Gly Ile Trp Thr Leu Leu Pro Leu Val Leu Thr Ser Val Ala
1 5 10 15

Arg Leu Ser Ser Lys Ser Val Asn Ala Gln Val Thr Asp Ile Asn Ser
20 25 30

Lys Gly Leu Glu Leu Arg Lys Thr Val Thr Thr Val Glu Thr Gln Asn
35 40 45

Leu Glu Gly Leu His His Asp Gly Gln Phe Cys His Lys Pro Cys Pro
50 55 60

Pro Gly Glu Arg Lys Ala Arg Asp Cys Thr Val Asn Gly Asp Glu Pro
65 70 75 80

Asp Cys Val Pro Cys Gln Glu Gly Lys Glu Tyr Thr Asp Lys Ala His
85 90 95

Phe Ser Ser Lys Cys Arg Arg Cys Arg Leu Cys Asp Glu Gly His Gly
100 105 110

Leu Glu Val Glu Ile Asn Cys Thr Arg Thr Gln Asn Thr Lys Cys Arg
115 120 125

Cys Lys Pro Asn Phe Phe Cys Asn Ser Thr Val Cys Glu His Cys Asp
130 135 140

Pro Cys Thr Lys Cys Glu His Gly Ile Ile Lys Glu Cys Thr Leu Thr
145 150 155 160

Ser Asn Thr Lys Cys Lys Glu Glu Gly Ser Arg Ser Asn Leu Gly Trp
165 170 175

Leu Cys Leu Leu Leu Leu Pro Ile Pro Leu Ile Val Trp Val Lys Arg
180 185 190

Lys Glu Val Gln Lys Thr Cys Arg Lys His Arg Lys Glu Asn Gln Gly
195 200 205

Ser His Glu Ser Pro Thr Leu Asn Pro Glu Thr
210 215

<210> 129

<211> 280

<212> PRT

<213> Rattus rattus

<400> 129

Met Gly Leu Ser Thr Val Pro Asp Leu Leu Leu Pro Leu Val Leu Leu
1 5 10 15

Glu Leu Leu Val Gly Ile Tyr Pro Ser Gly Val Ile Gly Leu Val Pro
20 25 30

His Leu Gly Asp Arg Glu Lys Arg Asp Ser Val Cys Pro Gln Gly Lys
35 40 45

Tyr Ile His Pro Gln Asn Asn Ser Ile Cys Cys Thr Lys Cys His Lys
50 55 60

Gly Thr Tyr Leu Tyr Asn Asp Cys Pro Gly Pro Gly Gln Asp Thr Asp
65 70 75 80

Cys Arg Glu Cys Glu Ser Gly Ser Phe Thr Ala Ser Glu Asn His Leu
85 90 95

Arg His Cys Leu Ser Cys Ser Lys Cys Arg Lys Glu Met Gly Gln Val
100 105 110

Glu Ile Ser Ser Cys Thr Val Asp Arg Asp Thr Val Cys Gly Cys Arg
115 120 125

Lys Asn Gln Tyr Arg His Tyr Trp Ser Glu Asn Leu Phe Gln Cys Phe
130 135 140

Asn Cys Ser Leu Cys Leu Asn Gly Thr Val His Leu Ser Cys Gln Glu
145 150 155 160

Lys Gln Asn Thr Val Cys Thr Cys His Ala Gly Phe Phe Leu Arg Glu
165 170 175

Asn Glu Cys Val Ser Cys Ser Asn Cys Lys Lys Ser Leu Glu Cys Thr
180 185 190

Lys Leu Cys Leu Pro Gln Ile Glu Asn Val Lys Gly Thr Glu Asp Ser
195 200 205

Gly Thr Thr Val Leu Leu Pro Leu Val Ile Phe Phe Gly Leu Cys Leu
210 215 220

Leu Ser Leu Leu Phe Ile Gly Leu Met Thr Arg Thr Gln Arg Trp Lys
225 230 235 240

Ser Lys Leu Tyr Ser Ile Val Cys Gly Lys Ser Thr Pro Glu Lys Glu
245 250 255

Gly Glu Leu Glu Gly Thr Thr Thr Lys Pro Leu Ala Pro Asn Pro Ser
260 265 270

Phe Ser Pro Thr Pro Gly Phe Thr
275 280

<210> 130

<211> 207

<212> PRT

<213> Rattus rattus

<400> 130

Met Leu Arg Leu Ile Ala Leu Leu Val Cys Val Val Tyr Val Tyr Gly
1 5 10 15

Asp Asp Val Pro Tyr Ser Ser Asn Gln Gly Lys Cys Gly Gly His Asp
20 25 30

Tyr Glu Lys Asp Gly Leu Cys Cys Ala Ser Cys His Pro Gly Phe Tyr
35 40 45

Ala Ser Arg Leu Cys Gly Pro Gly Ser Asn Thr Val Cys Ser Pro Cys
50 55 60

Glu Asp Gly Thr Phe Thr Ala Ser Thr Asn His Ala Pro Ala Cys Val
65 70 75 80

Ser Cys Arg Gly Pro Cys Thr Gly His Leu Ser Glu Ser Gln Pro Cys
85 90 95

Asp Arg Thr His Asp Arg Val Cys Asn Cys Ser Thr Gly Asn Tyr Cys
100 105 110

Leu Leu Lys Gly Gln Asn Gly Cys Arg Ile Cys Ala Pro Gln Thr Lys
115 120 125

Cys Pro Ala Gly Tyr Gly Val Ser Gly His Thr Arg Ala Gly Asp Thr
130 135 140

Leu Cys Glu Lys Cys Pro Pro His Thr Tyr Ser Asp Ser Leu Ser Pro
145 150 155 160

Thr Glu Arg Cys Gly Thr Ser Phe Asn Tyr Ile Ser Val Gly Phe Asn
165 170 175

Leu Tyr Pro Val Asn Glu Thr Ser Cys Thr Thr Thr Ala Gly His Asn
180 185 190

Glu Val Ile Lys Thr Lys Glu Phe Thr Val Thr Leu Asn Tyr Thr
195 200 205

<210> 131

<211> 227

<212> PRT

<213> Rattus rattus

<400> 131

Met Ala Pro Val Ala Val Trp Ala Ala Leu Ala Val Gly Leu Glu Leu
1 5 10 15

Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr
 20 25 30

Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Thr Thr Asp Gln
 35 40 45

Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys
 50 55 60

Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp
 65 70 75 80

Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys
 85 90 95

Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg
 100 105 110

Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu
 115 120 125

Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg
 130 135 140

Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val
 145 150 155 160

Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr
 165 170 175

Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly
 180 185 190

Asn Ala Ser Arg Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser
 195 200 205

Met Ala Pro Gly Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser
 210 215 220

Gln His Thr
 225

<210> 132

<211> 197

<212> PRT

<213> Rattus rattus

<400> 132

Met Val Ser Leu Pro Arg Leu Cys Ala Leu Trp Gly Cys Leu Leu Thr
 1 5 10 15

Ala Val His Leu Gly Gln Cys Val Thr Cys Ser Asp Lys Gln Tyr Leu
 20 25 30

His Asp Gly Gln Cys Cys Asp Leu Cys Gln Pro Gly Ser Arg Leu Thr
 35 40 45

Ser His Cys Thr Ala Leu Glu Lys Thr Gln Cys His Pro Cys Asp Ser
 50 55 60

Gly Glu Phe Ser Ala Gln Trp Asn Arg Glu Ile Arg Cys His Gln His
 65 70 75 80

Arg His Cys Glu Pro Asn Gln Gly Leu Arg Val Lys Lys Glu Gly Thr
 85 90 95

Ala Glu Ser Asp Thr Val Cys Thr Cys Lys Glu Gly Gln His Cys Thr
 100 105 110

Ser Lys Asp Cys Glu Ala Cys Ala Gln His Thr Pro Cys Ile Pro Gly
 115 120 125

Phe Gly Val Met Glu Met Ala Thr Glu Thr Thr Asp Thr Val Cys His
 130 135 140

Pro Cys Pro Val Gly Phe Phe Ser Asn Gln Ser Ser Leu Phe Glu Lys
 145 150 155 160

Cys Tyr Pro Trp Thr Ser Cys Glu Asp Lys Asn Leu Glu Val Leu Gln
 165 170 175

Lys Gly Thr Ser Gln Thr Asn Val Ile Cys Gly Leu Lys Ser Arg Met
 180 185 190

Arg Ala Leu Leu Val
 195

<210> 133

<211> 208

<212> PRT

<213> Rattus rattus

<400> 133

Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile Ile
 1 5 10 15

Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
20 25 30

Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
35 40 45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
50 55 60

Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65 70 75 80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln Glu
85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
100 105 110

Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
115 120 125

Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
130 135 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
145 150 155 160

Arg Lys His Thr Asn Cys Ser Ser Leu Gly Leu Leu Leu Ile Gln Lys
165 170 175

Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr
180 185 190

Gln Asn Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
195 200 205

<210> 134

<211> 224

<212> PRT

<213> Rattus rattus

<400> 134

Met Gly Ala Gly Ala Thr Gly Arg Ala Met Asp Gly Pro Arg Leu Leu
1 5 10 15

Leu Leu Leu Leu Leu Gly Val Ser Leu Gly Gly Ala Lys Glu Ala Cys
20 25 30

Pro Thr Gly Leu Tyr Thr His Ser Gly Glu Cys Cys Lys Ala Cys Asn
 35 40 45

Leu Gly Glu Gly Val Ala Gln Pro Cys Gly Ala Asn Gln Thr Val Cys
 50 55 60

Glu Pro Cys Leu Asp Ser Val Thr Phe Ser Asp Val Val Ser Ala Thr
 65 70 75 80

Glu Pro Cys Lys Pro Cys Thr Glu Cys Val Gly Leu Gln Ser Met Ser
 85 90 95

Ala Pro Cys Val Glu Ala Asp Asp Ala Val Cys Arg Cys Ala Tyr Gly
 100 105 110

Tyr Tyr Gln Asp Glu Thr Thr Gly Arg Cys Glu Ala Cys Arg Val Cys
 115 120 125

Glu Ala Gly Ser Gly Leu Val Phe Ser Cys Gln Asp Lys Gln Asn Thr
 130 135 140

Val Cys Glu Glu Cys Pro Asp Gly Thr Tyr Ser Asp Glu Ala Asn His
 145 150 155 160

Val Asp Pro Cys Leu Pro Cys Thr Val Cys Glu Asp Thr Glu Arg Gln
 165 170 175

Leu Arg Glu Cys Thr Arg Trp Ala Asp Ala Glu Cys Glu Glu Ile Pro
 180 185 190

Gly Arg Trp Ile Thr Arg Ser Thr Pro Pro Glu Gly Ser Asp Ser Thr
 195 200 205

Ala Pro Ser Thr Gln Glu Pro Glu Ala Pro Pro Glu Gln Asp Leu Ile
 210 215 220

<210> 135

<211> 202

<212> PRT

<213> Rattus rattus

<400> 135

Met Tyr Val Trp Val Gln Gln Pro Thr Ala Phe Leu Leu Leu Gly Leu
 1 5 10 15

Ser Leu Gly Val Thr Val Lys Leu Asn Cys Val Lys Asp Thr Tyr Pro
 20 25 30

Ser Gly His Lys Cys Cys Arg Glu Cys Gln Pro Gly His Gly Met Val
 35 40 45

Ser Arg Cys Asp His Thr Arg Asp Thr Val Cys His Pro Cys Glu Pro
 50 55 60

Gly Phe Tyr Asn Glu Ala Val Asn Tyr Asp Thr Cys Lys Gln Cys Thr
 65 70 75 80

Gln Cys Asn His Arg Ser Gly Ser Glu Leu Lys Gln Asn Cys Thr Pro
 85 90 95

Thr Glu Asp Thr Val Cys Gln Cys Arg Pro Gly Thr Gln Pro Arg Gln
 100 105 110

Asp Ser Ser His Lys Leu Gly Val Asp Cys Val Pro Cys Pro Pro Gly
 115 120 125

His Phe Ser Pro Gly Ser Asn Gln Ala Cys Lys Pro Trp Thr Asn Cys
 130 135 140

Thr Leu Ser Gly Lys Gln Ile Arg His Pro Ala Ser Asn Ser Val Cys
 145 150 155 160

Glu Asp Arg Ser Leu Leu Ala Thr Leu Leu Trp Glu Thr Gln Arg Thr
 165 170 175

Thr Phe Arg Pro Thr Thr Val Pro Ser Thr Thr Val Trp Pro Arg Thr
 180 185 190

Ser Gln Leu Pro Ser Thr Pro Thr Leu Val
 195 200

<210> 136

<211> 191

<212> PRT

<213> Rattus rattus

<400> 136

Met Gly Asn Asn Cys Tyr Asn Val Val Val Ile Val Leu Leu Leu Val
 1 5 10 15

Gly Cys Glu Lys Val Gly Ala Val Gln Asn Ser Cys Asp Asn Cys Gln
 20 25 30

Pro Gly Thr Phe Cys Arg Lys Tyr Asn Pro Val Cys Lys Ser Cys Pro
 35 40 45

Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn Cys Asn Ile Cys
50 55 60

Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys Phe Cys Ser Ser Thr
65 70 75 80

His Asn Ala Glu Cys Glu Cys Ile Glu Gly Phe His Cys Leu Gly Pro
85 90 95

Gln Cys Thr Arg Cys Glu Lys Asp Cys Arg Pro Gly Gln Glu Leu Thr
100 105 110

Lys Gln Gly Cys Lys Thr Cys Ser Leu Gly Thr Phe Asn Asp Gln Asn
115 120 125

Gly Thr Gly Val Cys Arg Pro Trp Thr Asn Cys Ser Leu Asp Gly Arg
130 135 140

Ser Val Leu Lys Thr Gly Thr Thr Glu Lys Asp Val Val Cys Gly Pro
145 150 155 160

Pro Val Val Ser Phe Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu
165 170 175

Gly Gly Pro Gly Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu
180 185 190

<210> 137

<211> 54

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 137

tatggatgaa gaaacttctc atcagctgct gtgtgataaa tgtccgccgg gtac

54

<210> 138

<211> 120

<212> PRT

<213> Homo sapiens

<400> 138

His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr Ala Pro Glu Pro
1 5 10 15

Gly Ser Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln Thr Ala Gln Met
20 25 30
Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys Val Phe Cys Thr
35 40 45
Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp Ser Thr Tyr Thr
50 55 60
Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys Gly Ser Arg Cys
65 70 75 80
Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg Glu Gln Asn Arg
85 90 95
Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu Ser Lys Gln Glu
100 105 110
Gly Cys Arg Leu Cys Ala Pro Leu
115 120

<210> 139

<211> 380

<212> PRT

<213> Homo sapiens

<400> 139

Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp Glu Glu Thr Ser His
1 5 10 15
Gln Leu Leu Cys Asp Lys Cys Pro Pro Gly Thr Tyr Leu Lys Gln His
20 25 30
Cys Thr Ala Lys Trp Lys Thr Val Cys Ala Pro Cys Pro Asp His Tyr
35 40 45
Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys Leu Tyr Cys Ser Pro
50 55 60
Val Cys Lys Glu Leu Gln Tyr Val Lys Gln Glu Cys Asn Arg Thr His
65 70 75 80
Asn Arg Val Cys Glu Cys Lys Glu Gly Arg Tyr Leu Glu Ile Glu Phe
85 90 95
Cys Leu Lys His Arg Ser Cys Pro Pro Gly Phe Gly Val Val Gln Ala
100 105 110

Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg Cys Pro Asp Gly Phe
 115 120 125
 Phe Ser Asn Glu Thr Ser Ser Lys Ala Pro Cys Arg Lys His Thr Asn
 130 135 140
 Cys Ser Val Phe Gly Leu Leu Leu Thr Gln Lys Gly Asn Ala Thr His
 145 150 155 160
 Asp Asn Ile Cys Ser Gly Asn Ser Glu Ser Thr Gln Lys Cys Gly Ile
 165 170 175
 Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr
 180 185 190
 Lys Phe Thr Pro Asn Trp Leu Ser Val Leu Val Asp Asn Leu Pro Gly
 195 200 205
 Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Gln His Ser
 210 215 220
 Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn
 225 230 235 240
 Lys Ala Gln Asp Ile Val Lys Lys Ile Ile Gln Asp Ile Asp Leu Cys
 245 250 255
 Glu Asn Ser Val Gln Arg His Ile Gly His Ala Asn Leu Thr Phe Glu
 260 265 270
 Gln Leu Arg Ser Leu Met Glu Ser Leu Pro Gly Lys Lys Val Gly Ala
 275 280 285
 Glu Asp Ile Glu Lys Thr Ile Lys Ala Cys Lys Pro Ser Asp Gln Ile
 290 295 300
 Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr
 305 310 315 320
 Leu Lys Gly Leu Met His Ala Leu Lys His Ser Lys Thr Lys His Phe
 325 330 335
 Pro Lys Thr Val Thr Gln Ser Leu Lys Lys Thr Ile Arg Phe Leu His
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 Ser Phe Thr Met Tyr Lys Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile
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 Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys Leu
 370 375 380

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 <213> Artificial Sequence

 <220>
 <223> huOPG
 <400> 140
 tggaccaccc agaagtacct tcattatgac 30

 <210> 141
 <211> 30
 <212> DNA
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 <220>
 <223> huOPG
 <400> 141
 gtcataatga aggtacttct ggggtggtcca 30

 <210> 142
 <211> 31
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> huOPG
 <400> 142
 ggaccaccca gcttcattat gacgaagaaa c 31

 <210> 143
 <211> 31
 <212> DNA
 <213> Artificial Sequence

 <220>

<223> huOPG

<400> 143

gtttcttcgt cataatgaag ctgggtggtc c

31

<210> 144

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 144

gtggaccacc caggacgaag aaacctctc

29

<210> 145

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 145

gagaggtttc ttcgtcctgg gtggtccac

29

<210> 146

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 146

cgtttcctcc aaagttcctt cattatgac

29

<210> 147

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 147

gtcataatga aggaactttg gaggaaacg

29

<210> 148

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 148

ggaaacgttt cctgcaaagt accttcatta tg

32

<210> 149

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> huOPG

<400> 149

cataatgaag gtactttgca ggaaacgttt cc

32

<210> 150

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> muOPG

<400> 150

cacgcaaaag tcgggaatag atgtcac

27

<210> 151

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> muOPG

<400> 151

gtgacatcta ttcccgactt ttgcgtg

27

<210> 152

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<212> DNA

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<220>

<223> muOPG

<400> 152

caccctgtcg gaagaggcct tcttc

25

<210> 153

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<223> muOPG

<400> 153

gaagaaggcc tcttccgaca gggtg

25

<210> 154

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> muOPG

<400> 154

tgacctctcg gaaagcagcg tgca

24

<210> 155
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<223> muOPG

<400> 155
 tgcacgctgc tttccgagag gtca

24

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<400> 156
 cctcgaaatc gagcgagcag ctcc

24

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<400> 157
 cgatttcgag gtctttctcg ttctc

25

<210> 158
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<223> muOPG

<400> 158
ccgtgaaaat aagctcgta taactaggaa tgg 33

<210> 159

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<212> DNA

<213> Artificial Sequence

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<400> 159
ccattcctag ttataacgag cttattttca cgg 33

<210> 160

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<400> 160
cctctgagct caagcttccg aggaccacaa tgaacaag 38

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<212> DNA

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<400> 161
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<210> 162

<211> 38

<212> DNA

<213> Artificial Sequence

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<223> muOPG

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38

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<211> 38

<212> DNA

<213> Artificial Sequence

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<223> muOPG

<400> 163

cctctctcga gtcaaggaac agcaaacctg aagaaggc

38

<210> 164

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> muOPG

<400> 164

cctctgagct caagcttccg aggaccacaa tgaacaag

38

<210> 165

<211> 38

<212> DNA

<213> Artificial Sequence

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<223> muOPG

<400> 165

cctctctcga gtcactctgt ggtgagggtc gagtggcc

38

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cctctgagct caagcttccg aggaccacaa tgaacaag

38

<210> 167

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cctctctcga gtcaggatgt tttcaagtgc ttgagggc

38

<210> 168

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> pAMG22

<400> 168

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<210> 169

<211> 70

<212> PRT

<213> Homo sapiens

<400> 169

Ala	Leu	Leu	Val	Phe	Leu	Asp	Ile	Ile	Glu	Trp	Thr	Thr	Gln	Glu	Thr
1				5					10					15	

Phe	Pro	Pro	Lys	Tyr	Leu	His	Tyr	Asp	Pro	Glu	Thr	Gly	Arg	Gln	Leu
			20					25					30		

Leu Cys Asp Lys Cys Ala Pro Gly Thr Tyr Leu Lys Gln His Cys Thr
 35 40 45

Val Arg Arg Lys Thr Leu Cys Val Pro Cys Pro Asp Tyr Ser Tyr Thr
 50 55 60

Asp Ser Trp His Thr Ser
 65 70

<210> 170

<211> 48

<212> PRT

<213> Homo sapiens

<400> 170

Tyr Leu His Tyr Asp Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys
 1 5 10 15

Cys Ala Pro Gly Thr Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys
 20 25 30

Thr Leu Cys Val Pro Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His
 35 40 45

<210> 171

<211> 401

<212> PRT

<213> Mus musculus

<400> 171

Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Leu Leu Asp Ile Ile
 1 5 10 15

Glu Trp Thr Thr Gln Glu Thr Leu Pro Pro Lys Tyr Leu His Tyr Asp
 20 25 30

Pro Glu Thr Gly His Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
 35 40 45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
 50 55 60

Cys Pro Asp His Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
 65 70 75 80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Ser Val Lys Gln Glu
 85 90 95
 Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
 100 105 110
 Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Ser
 115 120 125
 Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Lys
 130 135 140
 Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
 145 150 155 160
 Ile Lys His Thr Asn Cys Ser Thr Phe Gly Leu Leu Leu Ile Gln Lys
 165 170 175
 Gly Asn Ala Thr His Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr
 180 185 190
 Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
 195 200 205
 Phe Ala Val Pro Thr Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val
 210 215 220
 Asp Ser Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
 225 230 235 240
 Lys Arg Arg His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
 245 250 255
 Trp Lys His Gln Asn Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln
 260 265 270
 Asp Ile Asp Leu Cys Glu Ser Ser Val Gln Arg His Leu Gly His Ser
 275 280 285
 Asn Leu Thr Thr Glu Gln Leu Leu Ala Leu Met Glu Ser Leu Pro Gly
 290 295 300
 Lys Lys Ile Ser Pro Glu Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys
 305 310 315 320
 Ser Ser Glu Gln Leu Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
 325 330 335
 Gly Asp Gln Asp Thr Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu
 340 345 350

Lys Thr Ser His Phe Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr
355 360 365

Met Arg Phe Leu His Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu
370 375 380

Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
385 390 395 400

Leu

<210> 172

<211> 401

<212> PRT

<213> Rattus rattus

<400> 172

Met Asn Lys Trp Leu Cys Cys Ala Leu Leu Val Phe Leu Asp Ile Ile
1 5 10 15

Glu Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
20 25 30

Pro Glu Thr Gly Arg Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr
35 40 45

Tyr Leu Lys Gln His Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro
50 55 60

Cys Pro Asp Tyr Ser Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
65 70 75 80

Val Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Thr Val Lys Gln Glu
85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr
100 105 110

Leu Glu Leu Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
115 120 125

Gly Val Leu Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
130 135 140

Cys Pro Asp Gly Phe Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys
145 150 155 160

Arg Lys His Thr Asn₁₆₅ Cys Ser Ser Leu Gly₁₇₀ Leu Leu Leu Ile Gln₁₇₅ Lys
 Gly Asn Ala Thr₁₈₀ His Asp Asn Val Cys₁₈₅ Ser Gly Asn Arg Glu₁₉₀ Ala Thr
 Gln Asn Cys₁₉₅ Gly Ile Asp Val Thr₂₀₀ Leu Cys Glu Glu Ala₂₀₅ Phe Phe Arg
 Phe Ala₂₁₀ Val Pro Thr Lys Ile₂₁₅ Ile Pro Asn Trp Leu₂₂₀ Ser Val Leu Val
 Asp₂₂₅ Ser Leu Pro Gly Thr₂₃₀ Lys Val Asn Ala Glu₂₃₅ Ser Val Glu Arg Ile₂₄₀
 Lys Arg Arg His Ser₂₄₅ Ser Gln Glu Gln Thr₂₅₀ Phe Gln Leu Leu Lys₂₅₅ Leu
 Trp Lys His Gln₂₆₀ Asn Arg Asp Gln Glu₂₆₅ Met Val Lys Lys Ile₂₇₀ Ile Gln
 Asp Ile Asp₂₇₅ Leu Cys Glu Ser Ser₂₈₀ Val Gln Arg His Ile₂₈₅ Gly His Ala
 Asn Leu₂₉₀ Thr Thr Glu Gln Leu₂₉₅ Arg Ile Leu Met Glu₃₀₀ Ser Leu Pro Gly
 Lys₃₀₅ Lys Ile Ser Pro Asp₃₁₀ Glu Ile Glu Arg Thr₃₁₅ Arg Lys Thr Cys₃₂₀
 Pro Ser Glu Gln Leu₃₂₅ Leu Lys Leu Leu Ser₃₃₀ Leu Trp Arg Ile Lys₃₃₅ Asn
 Gly Asp Gln Asp₃₄₀ Thr Leu Lys Gly Leu₃₄₅ Met Tyr Ala Leu Lys₃₅₀ His Leu
 Lys Ala Tyr₃₅₅ His Phe Pro Lys Thr₃₆₀ Val Thr His Ser Leu₃₆₅ Arg Lys Thr
 Ile Arg₃₇₀ Phe Leu His Ser Phe₃₇₅ Thr Met Tyr Arg Leu₃₈₀ Tyr Gln Lys Leu
 Phe₃₈₅ Leu Glu Met Ile Gly₃₉₀ Asn Gln Val Gln Ser₃₉₅ Val Lys Ile Ser Cys₄₀₀

Leu

<210> 173

<211> 401

<212> PRT

<213> Homo sapiens

<400> 173

Met Asn Lys Leu Leu Cys Cys Ala Leu Val Phe Leu Asp Ile Ser Ile
 1 5 10 15

Lys Trp Thr Thr Gln Glu Thr Phe Pro Pro Lys Tyr Leu His Tyr Asp
 20 25 30

Glu Glu Thr Ser His Gln Leu Leu Cys Asp Lys Cys Pro Pro Gly Thr
 35 40 45

Tyr Leu Lys Gln His Cys Thr Ala Lys Trp Lys Thr Val Cys Ala Pro
 50 55 60

Cys Pro Asp His Tyr Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys
 65 70 75 80

Leu Tyr Cys Ser Pro Val Cys Lys Glu Leu Gln Tyr Val Lys Gln Glu
 85 90 95

Cys Asn Arg Thr His Asn Arg Val Cys Glu Cys Lys Glu Gly Arg Tyr
 100 105 110

Leu Glu Ile Glu Phe Cys Leu Lys His Arg Ser Cys Pro Pro Gly Leu
 115 120 125

Gly Val Val Gln Ala Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Arg
 130 135 140

Cys Pro Asp Gly Phe Phe Ser Asn Glu Thr Ser Ser Lys Ala Pro Cys
 145 150 155 160

Arg Lys His Thr Asn Cys Ser Val Phe Gly Leu Leu Leu Thr Gln Lys
 165 170 175

Gly Asn Ala Thr His Asp Asn Ile Cys Ser Gly Asn Ser Glu Ser Thr
 180 185 190

Gln Lys Cys Gly Ile Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg
 195 200 205

Phe Ala Val Pro Thr Lys Phe Thr Pro Asn Trp Leu Ser Val Leu Val
 210 215 220

Asp Asn Leu Pro Gly Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile
 225 230 235 240

Lys Arg Gln His Ser Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu
245 250 255

Trp Lys His Gln Asn Lys Asp Gln Asp Ile Val Lys Lys Ile Ile Gln
260 265 270

Asp Ile Asp Leu Cys Glu Asn Ser Val Gln Arg His Ile Gly His Ala
275 280 285

Asn Leu Thr Phe Glu Gln Leu Arg Ser Leu Met Glu Ser Leu Pro Gly
290 295 300

Lys Lys Val Gly Ala Glu Asp Ile Glu Lys Thr Ile Lys Ala Cys Lys
305 310 315 320

Pro Ser Asp Gln Ile Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn
325 330 335

Gly Asp Gln Asp Thr Leu Lys Gly Leu Met His Ala Leu Lys His Ser
340 345 350

Lys Thr Tyr His Phe Pro Lys Thr Val Thr Gln Ser Leu Lys Lys Thr
355 360 365

Ile Arg Phe Leu His Ser Phe Thr Met Tyr Lys Leu Tyr Gln Lys Leu
370 375 380

Phe Leu Glu Met Ile Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys
385 390 395 400

Leu

<210> 174

<211> 139

<212> PRT

<213> Homo sapiens

<400> 174

Pro Pro Lys Tyr Leu His Tyr Asp Glu Glu Thr Ser His Gln Leu Leu
1 5 10 15

Cys Asp Lys Cys Pro Pro Gly Thr Tyr Leu Lys Gln His Cys Thr Ala
20 25 30

Lys Trp Lys Thr Val Cys Ala Pro Cys Pro Asp His Tyr Tyr Thr Asp
35 40 45

Ser Trp His Thr Ser Asp Glu Cys Leu Tyr Cys Ser Pro Val Cys Lys
50 55 60

Glu Leu Gln Tyr Val Lys Gln Glu Cys Asn Arg Thr His Asn Arg Val
65 70 75 80

Cys Glu Cys Lys Glu Gly Arg Tyr Leu Glu Ile Glu Phe Cys Leu Lys
85 90 95

His Arg Ser Cys Pro Pro Gly Phe Gly Val Val Gln Ala Gly Thr Pro
100 105 110

Glu Arg Asn Thr Val Cys Lys Arg Cys Pro Asp Gly Phe Phe Ser Asn
115 120 125

Glu Thr Ser Ser Lys Ala Pro Cys Arg Lys His
130 135

<210> 175

<211> 380

<212> PRT

<213> Mus musculus

<400> 175

Glu Thr Leu Pro Pro Lys Tyr Leu His Tyr Asp Pro Glu Thr Gly His
1 5 10 15

Gln Leu Leu Cys Asp Lys Cys Ala Pro Gly Thr Tyr Leu Lys Gln His
20 25 30

Cys Thr Val Arg Arg Lys Thr Leu Cys Val Pro Cys Pro Asp His Ser
35 40 45

Tyr Thr Asp Ser Trp His Thr Ser Asp Glu Cys Val Tyr Cys Ser Pro
50 55 60

Val Cys Lys Glu Leu Gln Ser Val Lys Gln Glu Cys Asn Arg Thr His
65 70 75 80

Asn Arg Val Cys Glu Cys Glu Glu Gly Arg Tyr Leu Glu Ile Glu Phe
85 90 95

Cys Leu Lys His Arg Ser Cys Pro Pro Gly Ser Gly Val Val Gln Ala
100 105 110

Gly Thr Pro Glu Arg Asn Thr Val Cys Lys Lys Cys Pro Asp Gly Phe
115 120 125

Phe Ser Gly Glu Thr Ser Ser Lys Ala Pro Cys Ile Lys His Thr Asn
 130 135 140
 Cys Ser Thr Phe Gly Leu Leu Leu Ile Gln Lys Gly Asn Ala Thr His
 145 150 155 160
 Asp Asn Val Cys Ser Gly Asn Arg Glu Ala Thr Gln Lys Cys Gly Ile
 165 170 175
 Asp Val Thr Leu Cys Glu Glu Ala Phe Phe Arg Phe Ala Val Pro Thr
 180 185 190
 Lys Ile Ile Pro Asn Trp Leu Ser Val Leu Val Asp Ser Leu Pro Gly
 195 200 205
 Thr Lys Val Asn Ala Glu Ser Val Glu Arg Ile Lys Arg Arg His Ser
 210 215 220
 Ser Gln Glu Gln Thr Phe Gln Leu Leu Lys Leu Trp Lys His Gln Asn
 225 230 235 240
 Arg Asp Gln Glu Met Val Lys Lys Ile Ile Gln Asp Ile Asp Leu Cys
 245 250 255
 Glu Ser Ser Val Gln Arg His Leu Gly His Ser Asn Leu Thr Thr Glu
 260 265 270
 Gln Leu Leu Ala Leu Met Glu Ser Leu Pro Gly Lys Lys Ile Ser Pro
 275 280 285
 Glu Glu Ile Glu Arg Thr Arg Lys Thr Cys Lys Ser Ser Glu Gln Leu
 290 295 300
 Leu Lys Leu Leu Ser Leu Trp Arg Ile Lys Asn Gly Asp Gln Asp Thr
 305 310 315 320
 Leu Lys Gly Leu Met Tyr Ala Leu Lys His Leu Lys Thr Ser His Phe
 325 330 335
 Pro Lys Thr Val Thr His Ser Leu Arg Lys Thr Met Arg Phe Leu His
 340 345 350
 Ser Phe Thr Met Tyr Arg Leu Tyr Gln Lys Leu Phe Leu Glu Met Ile
 355 360 365
 Gly Asn Gln Val Gln Ser Val Lys Ile Ser Cys Leu
 370 375 380

<210> 176

<211> 6037

<212> DNA

<213> Homo sapiens

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Asp Trp His
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